ABSTRACT OF THE DISCLOSURE

A holding fixture for use with an interferometric optical microscope is adapted to receive an optical fiber connector. The fixture comprises a base plate mountable to the microscope and having a base plate opening sized to receive the optical fiber connector. An aperture plate is connected to the base plate, the aperture plate having an aperture opening overlapping the base plate opening. The fixture allows the optical fiber connector to be held in a precise and repeatable orientation relative to the microscope in turn facilitating accurate and precise measurements of endface geometry of the optical fiber connector. A method of using the fixture allows a calibration factor to be calculated for the fixture.